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The views expressed in this paper are those of the authors.
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Abstract

The authors show that the widening of a foreign firm's U.S. investor base and the improved information environment associated with cross-listing on a U.S. exchange each have a separately identifiable effect on a firm's valuation. The increase in valuation associated with cross-listing is transitory, not permanent. Valuations of Canadian firms peak in the year of cross-listing and fall monotonically thereafter, regardless of the level of U.S. investor holdings or the ownership structure of the firm. Cross-listed firms with a 20 per cent or more blockholder attract a similar number of U.S. institutional investors as widely held firms, on average, but experience a lower increase in valuation at high levels of investor recognition. While U.S. investors are less willing to invest in firms with dual-class shares, these firms benefit more from cross-listing even when they fail to widen their U.S. investor base, suggesting that the reduction in information asymmetry between controlling and minority investors has a separate impact on valuation for firms where agency problems are greatest.

JEL classification: G12, G15
Bank classification: Financial markets; International topics

Résumé

Les auteurs montrent que la hausse de la participation des investisseurs américains au capital d'une entreprise étrangère et l'amélioration de l'information disponible sur celle-ci après son inscription à une bourse des États-Unis ont sur la valeur de ses actions des effets discernables l'un de l'autre. L'appréciation qu'enregistrent les titres d'entreprises canadiennes nouvellement intercotées est passagère. Leur cours culmine en effet durant l'année qui suit, puis il diminue de façon monotone, peu importe le niveau de participation des investisseurs américains au capital ou la structure de l'actionnariat de l'entreprise. Les sociétés intercotées contrôlées par un actionnaire dominant qui possède au moins 20 % du capital-actions attirent en moyenne autant d'investisseurs institutionnels aux États-Unis que celles dont la propriété est plus dispersée, mais leur titre s'apprécie moins lorsqu'elles sont déjà bien connues des investisseurs. S'il est vrai que les investisseurs américains hésitent davantage à investir dans les entreprises émettant deux catégories d'actions, il reste que ces entreprises tirent plus de bénéfices de l'intercotation même quand elles ne parviennent pas à élargir leur actionnariat aux États-Unis. Ce résultat donne à penser que la réduction de l'asymétrie d'information entre l'actionnaire dominant et les actionnaires minoritaires a un effet distinct sur la valeur de l'action là où le conflit d'intérêts entre les deux types d'actionnaire est le plus grand.

Classification JEL : G12, G15
Classification de la Banque : Marchés financiers; Questions internationales

1. Introduction

The literature on cross-listing documents a number of benefits to listing on a foreign stock exchange—benefits that are now seen as the conventional wisdom (Karolyi 2006). Foreign firms that cross-list in the United States have higher valuations, a lower cost of capital, and increased liquidity. Foerster and Karolyi (1999) and Baker, Nofsinger, and Weaver (2002) attribute part of the increase in a cross-listed firm's valuation to the broadening of its U.S. investor base and the greater visibility of the firm, as predicted by Merton's (1987) investor recognition hypothesis. Merton develops a capital-asset-pricing model under incomplete information where an increase in the number of investors aware of a firm lowers the expected returns on the firm's stock, resulting in a contemporaneous increase in valuation. This theory provides an incentive for foreign firms that are either neglected or have a low number of investors to cross-list on a U.S. stock exchange if this action would increase their overall shareholder base. Indeed, surveys of managers confirm that one of the reasons behind their decision to cross-list is to broaden their shareholder base by attracting U.S. investors (Mittoo 1992; Fanto and Karmel 1997; and Bancel and Mittoo 2001).

While Foerster and Karolyi (1999) and Baker, Nofsinger, and Weaver (2002) link increased investor recognition with higher valuations at the time of cross-listing, these studies do not address whether the impact on valuation is transitory or permanent. They also do not address how the investor recognition effect varies cross-sectionally based on firm characteristics. In particular, ownership structure has been shown to influence the decision of U.S. investors to purchase a foreign stock. A large literature following Jensen and Meckling (1976) highlights how agency problems between controlling and minority shareholders lead to greater information asymmetry and lower valuations of closely held firms.[1] Concentrated ownership affects the willingness of U.S. investors to buy a foreign stock. Edison and Warnock (2004), Leuz, Lins, and Warnock (2005), and Ferreira and Matos (2006) find that U.S. institutional investors avoid foreign firms controlled by a large blockholder, particularly where owners use dual-class shares to separate cash-flow rights from control rights. These studies suggest that a firm's ownership structure may condition the benefits of increased investor recognition following cross-listing.

This paper makes three contributions to the literature. First, we show cross-sectionally that the magnitude of the increase in valuation at the time of cross-listing is conditional on the widening

[1] Morck, Wolfenzon, and Yeung (2005) summarize this literature. Studies by Claessens et al. (2002), Lins (2003), Lemmon and Lins (2003), and Doidge et al. (2006) link information asymmetry between controlling and minority shareholders with lower valuations of closely held firms.

of the firm's U.S. shareholder base. Using a 16-year panel of 277 Canadian firms listed on U.S. stock exchanges between 1989 and 2004, we show that those firms that attract the most U.S. investors at the time of cross-listing experience the greatest increase in valuation from this event. This relationship is robust when controlling for firm characteristics such as size, growth opportunities, profitability, leverage, visibility in the home market, and liquidity. Not all firms, however, benefit from increased investor recognition following a U.S. listing. Firms that attract few or no U.S. investors do not experience an increase in valuation and are valued similarly to non-cross-listed firms.

Second, we show that changes in the U.S. investor base over time cannot explain the pre-listing run-up and post-listing decline associated with cross-listing on a U.S. stock exchange. Canadian firms cross-list following a run-up in their valuation that begins three to five years prior to cross-listing. Valuations peak in the year of cross-listing and fall monotonically thereafter. Firms that attract the greatest number of U.S. institutional investors benefit most initially; yet, even these firms are valued no differently than non-cross-listed firms within several years of cross-listing. Any increase in valuation associated with higher investor recognition is temporary, and the valuation premium of these firms returns to their pre-listing levels by the third year post-cross-listing.

Third, we show that a widening of the shareholder base, as predicted by Merton's (1987) hypothesis, and an improved information environment are separate effects. Canadian firms with a controlling shareholder holding 20 per cent or more of the votes and a single share class are valued similarly to widely held firms. Firms that use dual-class shares to separate cash-flow from control rights, however, are valued at a discount to widely held firms, suggesting that the agency conflicts between minority and controlling shareholders are acute for these firms. For this reason, we expect that firms with dual-class shares should experience the greatest valuation benefit from cross-listing. The evidence supports this conjecture. We find that the *relative* increase in valuation is greatest for firms with dual-class shares. While this effect cannot be distinguished when investor recognition is high, it is visible at low levels of investor recognition. Firms with dual-class shares benefit more even when they attract few or no U.S. investors. This valuation increase despite a failure to widen the shareholder base is consistent with a reduction of information asymmetry between controlling and minority shareholders. Thus, an improvement in the firm's information environment is important for firms where agency problems are most acute.

The remainder of this paper is organized as follows. Section 2 develops hypotheses based on a Merton's investor recognition hypothesis, and describes the literature on concentrated ownership

and firm valuation. Section 3 describes the data and methodology, and presents descriptive statistics of our sample. Section 4 presents the empirical results. Section 5 concludes.

2. Development of Hypotheses

The impact of cross-listing on a foreign stock exchange is a much-researched phenomenon (Karolyi 1998, 2006). While studies have generated a number of explanations for the benefits of cross-listing, there is little consensus on what effect dominates. The evidence in the literature suggests three main drivers: increased liquidity as the foreign firm's shares become more accessible to U.S. investors (the liquidity hypothesis); increased investor recognition associated with a widening of the cross-listed firm's shareholder base and an improvement in its information environment (the investor recognition hypothesis); and reduced information asymmetry between controlling and minority shareholders, owing to greater monitoring and transparency (the bonding hypothesis). In this paper, we focus on the investor recognition and bonding hypotheses, while controlling for the impact of increased liquidity.[2] This section develops hypotheses related to each of these explanations separately, which we first test separately and then jointly in the third section.

2.1 Merton's (1987) investor recognition hypothesis

Merton (1987) modifies the Sharpe-Lintner capital-asset-pricing model to include a factor, the 'shadow cost of information,' that proxies for incomplete information about the securities available for investment. The shadow cost of information is defined for stock *i* as

$$\lambda_i = \delta \sigma_i^2 x_i (1 - q_i) / q_i , \tag{1}$$

where δ is the coefficient of aggregate risk aversion, σ_i^2 is the firm-specific component of the stock's return variance, x_i is the market value of the firm relative to the market value of traded securities, and q_i is the size of the firm's investor base relative to the potential universe of investors. Another way to interpret q_i is as the proportion of investors who are aware of the firm. The relationship between the shadow cost of information, λ_i, and the expected excess return of the stock, $E(R_i)$, is as follows:

$$E(R_i) - E(R_i^*) = \lambda_i \frac{E(R_i^*)}{R_f}, \tag{2}$$

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[2] Foerster and Karolyi (1999) and Mittoo (2003) provide comprehensive discussions of the liquidity hypothesis.

where $E(R_i^*)$ is the expected excess return of the stock for the complete information case when all investors are aware of the security ($q_i = 1$), and R_f is the return on the riskless security. The implication is that if the firm's investor base increases, the shadow cost of incomplete information falls and observed returns should decline, on average. In the setting of cross-listing, the implication is that foreign firms that are either neglected or have a low number of investors will have an incentive to cross-list on a foreign stock exchange if this action will increase their overall shareholder base.

Foerster and Karolyi (1999) test the hypothesis in a study of 153 firms from 11 countries that cross-listed on a U.S. exchange from 1976 to 1992. The authors measure investor recognition by the change in the number of shareholders. They find that firms that cross-list experience an increase in their shareholder base by about 28.8 per cent, and that the firms experiencing the greatest increase in the number of shareholders exhibit a greater increase in stock price in response to the listing announcement. Baker, Nofsinger, and Weaver (2002) support this finding using media visibility and the number of equity analysts following a firm as alternative proxies for the level of investor recognition in a stock. They study 193 foreign firms that cross-listed on the NYSE and 179 firms that cross-listed on the London Stock Exchange between 1976 and 1996. Consistent with the investor recognition hypothesis, cross-listed firms experience an increase in media visibility and analyst following, both of which are associated with a decrease in the cost of equity capital after the listing. Lang, Lins, and Miller (2003) document a similar increase in analyst following, as well as an improvement in earnings forecasts, for firms that cross-list.

Merton's (1987) model focuses specifically on the size of the firm's investor base under incomplete information relative to the total investor base for the complete information case when all investors are aware of the security. One cannot directly observe, however, how many potential investors are aware of each firm. In this study we use two related proxies for investor recognition—the number of U.S. institutional investors holding the stock, and the proportional ownership by U.S. institutional investors of the stock—both measured post-cross-listing.[3] While these measures are imperfect proxies for investor recognition, it is reasonable to assume that they are highly correlated with investors' awareness of the stock. Formally, our first hypothesis (stated in the null form) is:

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[3] While analyst coverage is an important proxy used in these studies, I/B/E/S data on analyst coverage of Canadian firms is limited to only a small sample (Leuz 2003). For this reason, we do not test this variable in this analysis.

H1: The valuation premium of cross-listed Canadian firms relative to non-cross-listed Canadian firms is positively related to the level of investor recognition.

This hypothesis implies a cross-sectional difference in valuation based on the holdings of U.S. investors. Implicitly, the increase in valuation is permanent. Although Foerster and Karolyi (1999) and Baker, Nofsinger, and Weaver (2002) examine the impact of investor recognition on stock returns around the cross-listing event, they do not examine its duration or longevity beyond a one-year horizon.

Merton's theory is a general-equilibrium relationship that predicts a permanent increase in valuation only if the actual level of investor holdings remains higher post-cross-listing, near the complete information case. Several studies provide evidence that suggests this effect may not be permanent. Foerster and Karolyi (1999) note that the cross-listed firms in their sample show positive abnormal returns during the year prior to the actual listing, followed by negative abnormal returns in the years following a U.S. listing. Since the focus of their study is on the short-term effects, Foerster and Karolyi (1999) do not explain this longer-horizon pattern, but they suggest that it may be due to changes in levels of investor recognition or liquidity. Mittoo (2003) studies this pattern directly in an event study of Canadian firms that cross-listed between 1976 and 1998. She finds that Canadian cross-listed firms outperform the market by 30–40 per cent in the year prior to listing, but underperform the market by 13–30 per cent over the three years subsequent to listing. While liquidity gains are the major determinant of the short-run abnormal returns, Mittoo (2003) rules them out as an explanation of the longer-term performance, which she suggests is related to industry factors. Sarkissian and Schill (2004) provide further country-level evidence of this pattern in an event study of 764 firms from 35 countries that were cross-listed as of 1998. They study the residual returns from market regressions for the 10 years before and after cross-listing, and find the same pre-listing run-up and post-listing decline.[4] Taken together, these empirical results do not support the prediction of permanent gains from Merton's model. Hence, our second hypothesis focuses on the time-varying effect of investor recognition:

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[4] Rather than testing the investor recognition hypothesis, Sarkissian and Schill (2004) focus on home bias and examine the impact on residual returns of country-level variables, such as the size of exports, industry structure, culture, and distance. They suggest that firms from countries that are relatively more familiar to foreign investors before the listing benefit most from the foreign listing. These authors do not measure investor recognition directly. The only firm-level characteristics in their model are firm size and a dummy variable classifying firms into tradable and non-tradable sectors.

H2: The valuation premium of cross-listed Canadian firms relative to non-cross-listed Canadian firms in the years following cross-listing is associated with the level of investor recognition.

This hypothesis focuses on the time-series properties of U.S. investor holdings on valuation. It implies that only firms that maintain a wider shareholder base will continue to exhibit a premium valuation.

2.2 Ownership structure

The investor recognition hypothesis suggests that all firms stand to benefit from the increased visibility and broader investor base associated with cross-listing. The evidence suggests, however, that ownership structure may qualify this prediction. Edison and Warnock (2004), Leuz, Lins, and Warnock (2005), and Ferreira and Matos (2006) find that U.S. institutional investors avoid foreign firms that are controlled by a large blockholder. On the other hand, Ammer et al. (2005) find that the improvement in the availability and quality of value-relevant information about a firm is a key for determining which firms attract U.S. investment. They also find that U.S. investors show no reluctance to invest in countries with weak shareholder protection. Ownership structure is therefore an important variable conditioning any valuation gains from investor recognition.

A second important dimension is the presence of two or more share classes with differential voting rights.[5] By separating cash-flow rights from voting rights, dual-class share structures allow controlling shareholders to escape the wealth consequences of their own decisions. This separation weakens their alignment with minority shareholders and potentially increases the risk of expropriation. Thus the incentives to indulge in wealth diversionary behaviour or extract private benefits are higher in dual-class firms compared with firms that have a one-share-one-vote structure (DeAngelo and DeAngelo 1985; Grossman and Hart 1988).[6] This share structure may also affect the level of investor recognition, because a number of U.S. institutional investors are prohibited by charter from buying shares in firms with dual-class shares. Thus, our third hypothesis is:

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[5] Nenova (2003) reviews the literature on dual-class shares, and provides a rigorous analysis for measuring the private benefits of control.

[6] Attig (2005), Amoako-Adu and Smith (1995), and Jog and Riding (1986) document the widespread use of dual-class shares in Canada.

H3: Cross-listed Canadian firms with concentrated ownership or dual-class shares have lower investor recognition than widely held firms.

The bonding hypothesis suggests a different channel by which cross-listing can affect the valuation of firms with concentrated ownership. Doidge, Karolyi, and Stulz (2004) look at the firm-level effect of a U.S. listing, as opposed to the country-level effect, owing to the increased legal protection of shareholders. They model the trade-off that controlling shareholders face when deciding whether to list on a U.S. stock exchange. By listing in the United States, the firm increases the quality and quantity of information available to minority shareholders, and reduces the extent to which controlling shareholders can engage in expropriation. On the benefits side, listing on a U.S. exchange provides financially constrained firms with access to capital, and increases the firm's ability to take advantage of growth opportunities. Controlling shareholders will have an incentive to cross-list if the benefits that accrue to them of exploiting valuable growth opportunities exceed the costs of greater monitoring and lower consumption of the private benefits of control following cross-listing. This hypothesis is confirmed by Doidge et al. (2006), who find that firms with a large controlling shareholder are less likely to cross-list on a U.S. stock exchange, but that when they do they experience an increase in valuation and a greater increase in analyst coverage than the average cross-listed firm.

This bonding effect may be particularly important for firms where controlling shareholders use dual-class shares to separate cash-flow rights from control rights. Doidge (2004) tests this relationship in an event study of 137 firms with dual-class shares from 20 countries that cross-list on a U.S. exchange. He finds that, while both share classes benefit from a U.S. listing, the minority share class benefits proportionately more as the voting premium between share classes narrows. The reduced premium, he argues, proxies for the greater protection offered to minority shareholders by a U.S. listing.[7] Doidge et al. (2006) note that firms with a separation of control and cash-flow rights have lower valuations, on average, but experience a greater increase in valuation when they cross-list on a U.S. stock exchange than do widely held firms.

Given that bonding and investor recognition are both related to an improvement in the information environment of a firm, the bonding effect may be indistinguishable or completely subsumed by the investor recognition effect for most firms. The only case where the bonding effect may be isolated is for firms with acute agency conflicts that cross-list but fail to widen their U.S. shareholder base. In these cases, the effect of an improved information environment

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[7] Doidge (2004) does not consider whether this effect is related to investor recognition, and he does not look at the valuation of these firms.

should dominate, since cross-listing would be predicted to reduce the information asymmetry between controlling and minority investors. Hence, our fourth and final hypothesis:

H4: Cross-listed Canadian firms with concentrated ownership or dual-class shares will benefit more than widely held Canadian firms at low levels of investor recognition.

Our focus on the structure of ownership and the use of dual-class shares is related to Bris, Cantale, and Nishiotis (2005), who use an event study of 21 dual-class firms that list one of their share classes in the United States to disentangle competing cross-listing hypotheses. They find that improved liquidity and access to foreign investors are the most important effects, while the effects of improved investor protection are economically small. In our study we examine a broader group of firms—both firms that are closely and widely held and firms that are cross-listed and not cross-listed—while controlling for liquidity effects. Our study is also related to Doidge et al. (2006), who find that foreign firms with concentrated ownership that cross-list on a U.S. exchange benefit more than widely held firms in terms of increased valuation and analyst coverage. Our study complements these studies, but controls for the legal environment and changing firm-level characteristics over time, including ownership structure, allowing us to focus on the firm-level effect.

3. Data

We study Canadian firms over the 16-year period from 1989 to 2004. Canadian firms provide a unique experiment to investigate the relative impact of investor recognition and ownership structure on the valuation of cross-listed firms. First, focusing on one country controls for differences in country-specific factors. Canada is geographically close to the United States, shares the same time zone, has the same English common-law legal system, and offers similar levels of shareholder protection. Canadian accounting requires a similar level of disclosure as the U.S. GAAP. Under the Multi-Jurisdictional Disclosure System put in place in 1991 (and amended in 1994), Canadian companies can satisfy their U.S. filing and disclosure requirements using their Canadian filings. Thus, a study of Canadian firms allows us to focus on firm-level factors while controlling for country-level factors. Second, Canadian firms cross-list using an ordinary share that is no different from the shares issued by U.S. companies.[8] Canadian and U.S. payments and settlement systems are linked, and the impact of currency movements on cross-listed shares is minimized through continuous arbitrage across markets. Third, Canadian

[8] The exceptions are Canadian shares that are unregistered and trade over-the-counter on the National Quotation Bureau's 'pink sheets.' We consider only exchange-listed firms in this study.

firms make up the single largest group of foreign firms listed on U.S. stock exchanges, providing a large sample with considerable time-series and cross-sectional variation in firm-level characteristics. Fourth and most importantly, unlike the United States, where widely dispersed ownership is the norm, Canada has more concentrated corporate ownership with more large companies controlled by wealthy families, and more prevalent use of multiple classes of voting shares (Attig 2005; Morck, Stangeland, and Yeung 2000). This greater variation in ownership structure provides increased power for tests of the links between ownership structure and U.S. institutional holdings, while holding key country-level factors constant.

We collect annual financial statement data from Canadian and U.S Compustat databases. Stock prices are collected from the CRSP and the TSX-Canadian Financial Markets Research Center (CFMRC) monthly databases. U.S. institutional ownership data for cross-listed firms are obtained from the 13-F regulatory filings reported on the CDA/Spectrum database.[9] We identify cross-listed firms and the listing date using past issues of the *TSX Review*, news searches on Factiva, and data from U.S. stock exchanges. Data on the ownership of Canadian firms, as well as the relative size of cash flow and control stakes, are collected from annual management proxy circulars and annual issues of the *Financial Post* Top 500.[10]

The full sample consists of all Canadian firms that meet the following criteria: positive assets (DATA6 on Compustat), positive book value of equity (DATA60), positive sales (DATA12), and non-missing income before extraordinary items (DATA18). Each firm in our sample must have at least two years of consecutive sales data and market value of equity. We exclude financial firms to make our sample comparable with other studies. Firms that delist due to a takeover, bankruptcy, or other reason are present in our sample until the year of delisting.[11] These restrictions result in an initial sample size of 7,156 firm-year observations for 1,034 firms, of which 71 per cent are Canadian firms listed exclusively in the home market, and 29 per cent are Canadian firms listed on both a Canadian and a U.S. stock exchange.

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[9] Because there is no similar regulatory requirement in Canada for institutional investors to report their holdings, we do not have similar data for non-cross-listed Canadian firms. In addition, cross-listed firms for which there was no information in CDA/Spectrum are treated as having no U.S. institutional investors.

[10] Management proxy circulars are available electronically from 1997 onwards via the System for Electronic Document Analysis and Retrieval (SEDAR) at http://www.sedar.com. For years earlier than 1997, we relied on the summer issue of the *Financial Post* magazine, which provides an analysis of the top 800 firms. It identifies the name and control stake of the ultimate owner, based on management proxy circulars. However, no data are available on dual-class shares.

[11] The issue of delisting is often overlooked in cross-listing studies. Witmer (2006) provides a study of this topic.

To address the self-selection bias associated with the sample of cross-listed firms as well as the endogeneity of the cross-listing decision, we follow the cross-listing literature and construct a matched sample of non-cross-listed firms to better assess the impact of cross-listing on a firm's valuation.[12] The sample is constructed using one-to-one matching (without replacement) of cross-listed firms with non-cross-listed firms based on year, firm size measured by total assets, and industry membership using the first two digits of the North American Industry Classification System (NAICS) codes.[13] We convert the total assets of Canadian firms to U.S. dollars using the end-of-year exchange rate, and restrict the sample to those firms where the ratio of the total assets of the matched firms is not greater (less) than 1.25 (0.75). This process generates a matched sample of 2,802 firm-year observations for 683 firms, of which 277 firms are cross-listed. The observations are split evenly between cross-listed and non-cross-listed firms. Natural resource firms make up 38 per cent of the sample, followed by manufacturing and service firms at 30 per cent, high technology firms at 29 per cent, and transportation and utility stocks at 3 per cent.

The valuation measure we use is Tobin's q, which relates the market value of total assets to the book value of assets.[14] We measure Tobin's q as of the end of the calendar year for all firms in our sample. Consistent with Doidge, Karolyi, and Stulz (2004), we use the following control variables: future growth opportunities, firm size, profitability, and leverage. We use two proxies for future growth opportunities: past sales growth and the median Tobin's q of a firm's industry, where sales growth is computed as the two-year average growth rate in sales.[15] Firm size is computed as the log of total assets. Profitability is measured by the return on assets (ROA), calculated as earnings before interest and taxes scaled by total assets. Leverage is calculated as total debt divided by total assets. Most importantly, we control for the liquidity in a firm's shares. Firms that cross-list are expected to experience an increase in share turnover, as well as a tightening of bid-ask spreads, as more investors have access to the stock and stock exchanges in

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[12] Heckman, Ichimura, and Todd (1998) provide theoretical support for matching as an econometric technique for addressing endogeneity. Cross-listing studies that use matching include Baker, Nofsinger, and Weaver (2002), Claessens et al. (2002), Doidge, Karolyi, and Stulz (2004), Errunza and Miller (2000), Lang, Lins, and Miller (2003), and Reese and Weisbach (2002).

[13] To avoid picking up part of the announcement effect of cross-listing, we ensure that the non-cross-listed firms used for matching are those firms that never cross-list over the sample period.

[14] Doidge, Karolyi, and Stulz (2004), Lang, Lins, and Miller (2003) and Doidge et al. (2006) also use Tobin's q to assess the impact of cross-listing. Following these studies, we compute Tobin's q as the ratio of market value of equity plus book value of debt scaled by total assets. Both the numerator and denominator are denominated in the same currency.

[15] If the two-year growth rate is not available, one-year growth in sales is used.

the home and U.S. markets compete for order flow (Karolyi 1998; Mittoo 2003). We capture this effect by including a measure of annual share turnover, measured as the annual trading volume divided by the number of shares outstanding, which includes shares traded in both the home and the U.S. markets for the cross-listed shares. We winsorize these variables at the 1 per cent and 99 per cent levels to reduce the impact of outliers.

Panel A of Table 1 provides summary statistics of the control variables used in this study. The cross-listed firms that are matched with non-cross-listed firms are comparable in terms of total assets, since the differences between the mean and median of the cross-listed and non-cross-listed firms are not statistically significant. The mean market value of the cross-listed firms is higher, although the difference in the median market value is not statistically different. Consistent with previous studies, cross-listed firms have significantly higher Tobin's q ratios; the mean (median) ratio for the cross-listed firms is 1.783 (1.352), as compared with a mean (median) for the non-cross-listed firms of 1.401 (1.199). The mean and median sales growth rates, 29 per cent and 12 per cent, respectively, are similar across both samples. The mean ROA of cross-listed firms is lower than that for non-cross-listed firms, but the median ROA is higher. The mean of share turnover, a proxy for liquidity, is higher for cross-listed firms than for non-cross-listed firms, but the median is lower. Finally, cross-listed firms have a statistically lower leverage at both the mean and the median.

We include another control variable in the regressions that relates to a firm's information environment and trading characteristics.[16] We use a dummy variable to identify firms whose shares are included in the Toronto Stock Exchange 300 composite index (TSE300) for a given year.[17] Similar to the Standard & Poor's 500 index in the United States, the TSE300 index (later the S&P/TSX composite index) identifies the largest Canadian firms by market capitalization in a given year. Firms in the index benefit from increased visibility, a wider Canadian shareholder base, and greater trading activity, since many classes of investors, such as passive index funds, hold the shares in this index. The TSE300 and its successor do not restrict firms based on ownership structure, and firms with dual-class shares represent around 20 per cent of the firms in the index, on average. By including this variable, we control for a firm's investor recognition in the home market, in order to identify the increase in investor recognition due to the U.S. listing.

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[16] Ferreira and Matos (2006), for example, find that U.S. institutional investors prefer the shares of firms that are part of the Morgan Stanley Capital International (MSCI) All Country World Index. A large literature looks at how inclusion in the S&P500 index affects trading behaviour. Chen, Noronha, and Singal (2004) provide references to this literature.

[17] The TSE300 index was replaced by the S&P/TSX composite index in May 2002, at which time the number of firms was reduced to remove smaller, more illiquid firms.

This dummy variable has a 60 per cent correlation with firm size, a negative 1 per cent correlation with share turnover, and is orthogonal to the decision to cross-list in our sample.[18]

Panel B of Table 1 shows the frequencies of the different types of ownership structures.[19] Following La Porta, Lopez-de-Silanes, and Shleifer (1999), and subsequent studies on ownership stakes, we focus on the 20 per cent threshold, and treat firms that have a control stake below 20 per cent, or no control stake, as widely held. The literature on concentrated ownership suggests that intermediate stakes decrease firm value due to entrenchment effects, but larger stakes increase firm value due to greater incentive effects (Morck, Shleifer, and Vishny 1988; Claessens et al. 2002). But the use of mechanisms that separate cash-flow rights from control rights reduces the incentive effects and increases the risk that controlling shareholders will consume private benefits. To highlight these opposing effects, we distinguish between firms with a control stake of 20 per cent or more that feature a single share class (labelled Control 20%+), and firms with dual-class shares that—with few exceptions—have a control stake of 20 per cent or more (labelled Dual-class shares).[20] We therefore focus on three mutually exclusive groups of firms based on ownership structure: widely held firms, firms with a blockholder of 20 per cent or more and a single share class, and firms with a dual-class share structure.

Panel B reveals considerable variation in the ownership structure of cross-listed and non-cross-listed firms. Specifically, while 61.6 per cent of the cross-listed firms are characterized as widely held, only 40.8 per cent of the non-cross-listed firms are widely held. This finding is consistent with the predictions of Doidge, Karolyi, and Stulz (2004) that firms with a controlling shareholder are less likely to cross-list. In particular, only 28.3 per cent of the cross-listed firms have a control stake of 20 per cent or greater, compared with 39.5 per cent for the non-cross-listed sample, and only 10.1 per cent of the cross-listed firms have dual-class shares, as compared with 19.7 per cent of the non-cross-listed firms.

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[18] Part of the rationale for the reconstruction of the TSE300 index into the S&P/TSX composite index was to remove illiquid firms.

[19] In a sensitivity analysis, we examine whether the type of blockholder affects the results. We distinguish between firms controlled by a family/management group, a widely held corporation, or a widely held financial institution (such as a bank, mutual fund, or pension fund). Our results suggest that owner types do not have an impact on the results.

[20] Less than 4 per cent of observations of dual-class share firms have control stakes below 20 per cent; less than 1 per cent have control stakes below 10 per cent.

Panel C presents statistics on the wedge between voting rights and cash-flow rights for the firms that have dual-class shares, where exact data on these ratios are available.[21] While Claessens et al. (2002) focus on the absolute difference between control and cash-flow stakes, Lins (2003) and Lemmon and Lins (2003) use the ratio of control to cash flow (which they term cash-flow leverage). The absolute difference for both cross-listed and non-cross-listed firms is around 36.7 per cent, and the difference between the mean (median) of the two samples is not statistically different. When using the ratio of control to cash flow, the picture is somewhat different, since the mean (median) for non-cross-listed firms is 6.8x (3.0x) leverage, while the mean (median) for cross-listed firms is 3.7x (2.1x) leverage. The difference in the means is statistically different, but the difference in the medians is not. Overall, these statistics suggest that there is no significant difference in the wedge between the cross-listed companies and non-cross-listed companies with dual-class shares for this sample.[22]

Panel D provides univariate tests of the difference in the mean (median) Tobin's q ratio by type of ownership structure. Widely held firms that are cross-listed have the highest absolute valuations, with a mean (median) Tobin's q of 1.868 (1.424). This mean (median) is significantly higher than the mean (median) of non-cross-listed firms of 1.480 (1.260). This difference represents a premium of 26 per cent (13 per cent). The difference in the mean Tobin's q between cross-listed firms and non-cross-listed firms is 0.272 for Control 20%+ firms (a premium of 19 per cent), and 0.286 for dual-class firms (a premium of 25 per cent). Hence, it appears that all cross-listed firms are traded at a premium relative to non-cross-listed firms, regardless of the control structure. Notice that the dual-class firms have the lowest mean (median) valuations relative to widely held and Control 20%+ firms. This difference is statistically significant for both non-cross-listed and cross-listed firms. This univariate evidence is consistent with dual-class share firms having the most acute agency problems.

Looking at the cross-listed firms only, widely held firms have a small but economically important valuation premium over Control 20%+ firms. The mean (median) premium is 8 per cent (16 per cent) and is statistically significant at the 10 per cent (1 per cent) level. The

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[21] Cash-flow and ownership rights are calculated from a firm's management proxy circulars. These circulars are available electronically from 1997 onwards. We are not able to find accurate data for earlier years.

[22] We use both of these variables in the regressions that follow, but find that the coefficients are not statistically significant, because of the low variation between cross-listed and non-cross-listed firms. We therefore use a simple dummy variable to identify firms that have dual-class shares in the tables in this paper (alternative results are available upon request).

mean (median) premium of widely held firms over firms with dual-class shares is much larger, at 31 per cent (21 per cent), and is statistically different at the 1 per cent level for both statistics.

Panel E provides a preview of our results when controlling for the degree of widening of the U.S. investor base. We divide the cross-listed firms into two groups based on the number of U.S. investors that hold the stock in each year following cross-listing. INUMHI (INUMLO) takes the value of 1 if the firm is cross-listed and the number of U.S. institutional investors is greater (lower) than the median number of institutional investors, and zero otherwise. Notice that the valuations of cross-listed firms identified by INUMLO and INUMHI are statistically higher at the mean (median) than the non-cross-listed firms, as determined using a *t*-test (sign rank test). But also notice that the cross-listed firms that attract more than the median number of U.S. investors have the highest valuations, consistent with Merton's (1987) investor recognition hypothesis. Finally, note the rank ordering in valuations across all three groups, with widely held firms exhibiting higher valuations than Control 20%+ firms, and Control 20%+ firms exhibiting higher valuations than Dual-class firms.

These univariate findings are suggestive, but the comparisons do not control for firm-specific characteristics and other factors. The next section uses multivariate regressions to distinguish these effects.

4. Results

4.1 Cross-sectional analysis of investor recognition and valuation

Tables 2 and 3 show regression results of the relationship between investor recognition and cross-listing. The regressions are estimated using panel data with fixed effects, including year dummies. We estimate the regressions using fixed effects to capture a firm-specific effect that is random across firms but time-invariant for a given firm.[23] We are able to use other dummy variables due to the variation across time. For example, our sample includes over 120 firms that first cross-list over our sample period, 10 firms that either adopt or eliminate a dual-class share structure, and 82 firms with a single-share class that either become controlled at the 20 per cent level or become widely held. The coefficients of the year dummies are suppressed for purposes of exposition.

Column 1 of Table 2 presents the base regressions of the effect of cross-listing on valuation, proxied by Tobin's q. All the coefficients are significant at the 1 per cent level. Consistent with

[23] A Hausman test rejects the random-effects specification, although the direction and relative size of the coefficients are similar using random effects (results available upon request).

prior research, sales growth and industry q are positive, indicating a positive association between Tobin's q and growth opportunities. The coefficient on ROA is positive, suggesting that profitability is positively associated with higher valuations. The coefficient on the log of assets is negative, consistent with the size effect, while the coefficient on leverage is negative but not significant. Share turnover is positive but not significant. Membership in the TSE300 index is positive and significant, consistent with greater visibility being positively associated with valuation. More importantly, the coefficient on XLIST, a dummy variable equal to 1 if the firm is cross-listed and zero otherwise, is positive (0.318) and statistically significant at the 1 per cent level, indicating that cross-listed firms enjoy a higher valuation than non-cross-listed firms. This finding is consistent with the ubiquitous evidence in the cross-listing literature (Karolyi 1998, 2006).

Columns 2 through 7 of Table 2 test the hypotheses linking the valuation premium of cross-listed firms with investor recognition. We use two proxies for investor recognition: the log of the number of U.S. institutional investors (INS_NUM) and the percentage ownership of U.S. institutional investors (INS_HOL). Bushee (1998), among others, finds that there is potential endogeneity between the investment decision by institutional investors and Tobin's q, because institutional investors tend to hold firms that have higher valuations. We therefore estimate the regressions using two-stage least squares. In the first stage, we instrument for the number or percentage holdings of U.S. investors, and use the predicted values in the second-stage regressions. Columns 2 and 5 report the first-stage estimates (using panel regressions with fixed effects) of INS_NUM and INS_HOL, respectively, using as instruments both the control variables from column 1 and other factors identified in the literature that explain the holdings of U.S. institutional investors (see Frieder and Subrahmanyam 2005; Dahlquist and Robertsson 2002; Bushee 1998). These other factors are: a dummy variable (Loss) set equal to 1 if the firm reports negative earnings, and zero otherwise; research and development (R&D) intensity, measured as R&D expense divided by total sales; dividend yield, measured as dividends paid on common stock divided by market value of common equity; and a dummy variable for capital raising set equal to 1 if the firm raises capital in the United States at or subsequent to cross-listing, and zero otherwise.

The results in column 2 suggest that INS_NUM is positively associated with firm size, membership in the TSE300 index, and capital raising, and negatively associated with leverage and share turnover. These results are consistent with prior studies, except for the direction of share turnover. Column 3 provides the second-stage regressions, where we include the predicted value of INS_NUM. The coefficients on the control variables are very similar to the base

regression in column 1, although share turnover is now statistically significant, consistent with liquidity having a distinct effect on valuation from the amount of U.S. institutional ownership. The coefficient on the predicted INS_NUM is positive but not significant, contrary to the predictions of our first hypothesis (H1). The XLIST dummy is still positive, but no longer significant. There is clearly some interaction between cross-listing and institutional ownership that is not identified in this specification.

In column 4 we replace the XLIST dummy with two dummy variables identifying cross-listed firms in the lower and upper halves of INS_NUM for any given year. Specifically, INUMHI (INUMLO) takes the value of 1 if the firm is cross-listed and the number of U.S. institutional investors is greater (lower) than the median number of institutional investors, and zero otherwise. The coefficient on INUMHI is strongly positive and significant, suggesting that firms that attract more than the median number of U.S. investors have Tobin's q ratios that are higher by 0.482 (or 20 per cent) relative to the average firm in this regression. The coefficient on INUMLO (0.203) is not significant, indicating that the valuation of cross-listed firms that attract fewer than the median number of U.S. institutional investors is no different from firms that are not cross-listed. These results suggest that the valuation premium attributed to cross-listing is determined in part by the level of investor recognition. While cross-listed firms in general trade at a premium to non-cross-listed firms, the magnitude of the premium is positively related to the level of investor recognition.[24] Using this specification, we fail to reject our first hypothesis (H1).

Columns 5–7 replicate the results using our second proxy for investor recognition: the percentage ownership by U.S. institutional investors, INS_HOL. The results are similar to columns 2–4. In column 6, the coefficients on the XLIST dummy (0.199) and the predicted value of INS_HOL (1.073) are both positive and statistically significant. In column 7, the coefficient on the dummy variables for IHOLHI (0.356) is positive and significant, but the coefficient on IHOLLO (0.152) is not significant. Again the valuation of cross-listed firms that attract fewer than the median percentage holdings of U.S. institutional investors is no different from firms that are not cross-listed. Overall, the results of Table 2 suggest that cross-listed firms have a higher valuation than non-cross-listed firms, and that the valuation premium of cross-listed firms is positively associated with investor recognition.

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[24] As a sensitivity analysis, we estimate a regression including an interaction variable of XLIST and the predicted value of INS_NUM or INS_HOL. The coefficient on the interaction variable is positive and significant, consistent with the findings reported above. We conduct a similar analysis for the regressions that follow and obtain results similar to those reported.

4.2 Time-series analysis of investor recognition and valuation

The regressions in Table 2 show that the cross-sectional valuation premium of cross-listing depends in part on investor recognition, after controlling for firm-specific characteristics. These regressions do not capture the time-varying effect of cross-listing, since the dummy variables used—either the XLIST dummy or the interaction terms—identify the average effect for all cross-listed firms across all years. In this section, we address the time-varying dimension of investor recognition. We examine whether the effects of cross-listing on a firm's valuation are permanent or temporary by including cross-listing dummy variables relative to the year of cross-listing.

To motivate this analysis, Figure 1 shows the level of Tobin's q for firms that first cross-listed on a U.S. exchange between 1990 and 2003.[25] We also restrict the sample period for each firm to the five years before and after cross-listing, or the event window [-5, 5]. Panel A of Figure 1 shows a run-up in the mean (median) valuation, peaking in the year of cross-listing (XLIST year=0), followed by a decline in Tobin's q in subsequent years. This pre-listing run-up and post-listing decline is consistent with the findings in Foerster and Karolyi (1999), Mittoo (2003), and Sarkissian and Schill (2004), who show a similar pattern using abnormal returns, and Gozzi, Levine, and Schmukler (2005), who show this pattern using Tobin's q.[26] Notice that the average firm appears to return to its pre-cross-listing Tobin's q by year 3 after cross-listing, with a slight improvement over years 4 and 5. This picture suggests that the increase in valuation associated with cross-listing is time-varying, and appears to be largely transitory. While an announcement effect of cross-listing may explain part of the run-up close to the event, the outperformance begins from three years prior to cross-listing, suggesting that firms decide to cross-list following a period of strong performance.

Panels B and C of Figure 1 show the pattern based on U.S. investor holdings. We graph the average Tobin's q for firms in the upper and lower halves of INS_NUM and INS_HOL. The graphs indicate that firms that attract either a higher number of U.S. institutional investors (INUMHI) or a higher percentage of holdings by U.S. institutional investors (IHOLHI) almost double their valuations in the year of cross-listing relative to their valuation in the three years

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[25] These firms represent a subsample of the cross-listed firms in our matched sample, since some of the firms cross-listed prior to 1989, and so we do not capture the before-and-after effect of the cross-listing event.

[26] The results in Foerster and Karolyi (1999) correspond to the interval [-1,1] in Panel A of Figure 1, Mittoo (2003) to [-1,3], and Gozzi, Levine, and Schmukler (2005) to [-2,2]. Sarkissian and Schill (2004) examine the window [-10,10].

prior to cross-listing. However, these firms also experience a sharp decrease in valuation subsequent to cross-listing. These patterns, while reinforcing the importance of investor recognition, suggest that most of the effect wears off over time.

Table 3 presents regressions quantifying the valuation premium over time, using firms that first cross-listed between 1990 and 2003 matched with non-cross-listed firms. We focus on the period from the year of cross-listing until the fifth year following cross-listing, namely the interval [0,5]. In column 1, we repeat the base regression from Table 2. Although the sample is smaller, the coefficients of the controls have the same statistical significance and are of similar magnitude. A key difference is that the coefficient on the XLIST dummy (0.252) is no longer statistically significant, suggesting that this event does not increase the valuation of these firms, on average. In column 2 we include a dummy variable for each year subsequent to cross-listing relative to the year of cross-listing. For example, XLIST year 0 is the year of cross-listing, XLIST year 1 is the first year following cross-listing, and so on.[27] The regression results are consistent with the post-cross-listing decline in valuation shown in Figure 1, although the coefficients are not significant. The time-series effect does not show up as significant here, but is much stronger when the cross-listed firms are compared relative to their own history in section 4.4.

In column 3 we create dummies of the interaction of the year relative to cross-listing and INUMHI and INUMLO. The results suggest that firms with high institutional ownership (INUMHI) experience a large and statistically significant valuation increase in the year of cross-listing (1.108), but that the valuation premium dissipates in the subsequent years. This valuation premium falls to 0.602 in year 1 and to 0.471 in year 2, at which time it is no longer statistically different from zero.[28] In contrast, the coefficients involving INUMLO are not statistically significant, suggesting that cross-listed firms that fail to attract higher than the median number of U.S. investors do not exhibit statistically higher valuations from cross-listing.

Column 4 replicates the analysis in column 3 with our second proxy for investor recognition, INS_HOL. The results are similar. Specifically, column 4 shows that the coefficients on the dummies for the interaction between IHOLLO and XLIST are not significant. However, for high levels of investor recognition, there is a valuation premium in the year of cross-listing (0.611),

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[27] To conserve space, we group years 3, 4, and 5 under one dummy variable. When we include a separate dummy variable for years 3, 4, and 5, the coefficients decline in magnitude, and are not statistically different from zero.

[28] Untabulated tests show that these coefficients are statistically different from each other in year 0 and year 1, and in all other years relative to year 0.

but the premium decreases monotonically in the years post-cross-listing. The interaction is not statistically significant in any of the other years, suggesting that the valuation of these firms is no different from firms that attract fewer than the median proportional holdings of U.S. investors, on the one hand, or a matched sample of firms that do not cross-list, on the other. Crucially, the impact of investor recognition on Tobin's q wears off within one year of cross-listing.

Overall, the results suggest that the valuation premium attributed to cross-listing is decreasing monotonically in the years post-cross-listing. In fact, cross-listed companies are not valued at a premium relative to non-cross-listed companies as of the second year post-cross-listing. The results provide partial support to the second hypothesis (H2) that the valuation premium of cross-listed Canadian firms relative to non-cross-listed Canadian firms is conditional on maintaining a high level of investor recognition. Specifically, we find that firms that are able to capture high investor recognition enjoy a valuation premium at the time of cross-listing, although the valuation premium decreases monotonically and dissipates quickly. In contrast, cross-listed firms that do not broaden their U.S. investor base have similar valuations to non-cross-listed companies. While these results provide further support to the importance of investor recognition, they indicate that the impact of a wider U.S. investor base on valuations is transitory and does not lead to higher valuations that persist over time.

4.3 Investor recognition and valuation conditional on ownership structure

The analysis in Tables 2 and 3 considers the effect of investor recognition on a cross-listed firm's valuation, without considering how agency problems between controlling and minority shareholders may condition the results. Tables 4 and 5 test how the investor recognition effect on valuation varies based on the ownership structure of the firm. In Table 4 we provide evidence on the cross-sectional relation between Tobin's q, block holdings of 20 per cent or more, and the use of dual-class shares. In Table 5 we show the time-varying impact of investor recognition on Tobin's q, controlling for ownership structure (that also varies over time).

Column 1 in Table 4 presents the regression of Tobin's q on the control variables and dummy variables for different ownership structures. Specifically, Control 20%+ takes the value of 1 if a blockholder owns 20 per cent or more of the voting shares outstanding in firms with a single share class, and zero otherwise. Dual-class is a dummy variable set equal to 1 if the firm has a blockholder that controls the firm through superior voting shares, and zero otherwise. Given that all firm-years are classified into the three categories of ownership structure (the third category is widely held), the base case in the regressions that follow is widely held firms. The coefficient on Control 20%+ is not significantly different from zero, suggesting that there is no direct

association between Tobin's q and block holdings above 20 per cent. The coefficient on Dual-class, by contrast, is negative and significant, indicating that firms with dual-class shares are valued at a discount relative to widely held firms. This finding is consistent with Claessens et al. (2002), Lins (2003), and Lemmon and Lins (2003), who show a negative relationship between dual-class shares and firm value.

In columns 2 and 3, we examine the interaction between cross-listing and ownership structure. Specifically, in column 2 we repeat the regression in column 1, adding the XLIST variable. Consistent with the general finding in the literature, the coefficient on XLIST is positive (0.325) and statistically significant. In column 3 we interact the XLIST dummy with Control 20%+ and Dual-class, termed XLIST*control 20%+ and XLIST*dual-class, respectively, to examine whether the valuation premium changes with ownership structure. The coefficient on XLIST (0.303) is positive and significant, while the coefficients on XLIST*control 20%+ (-0.052) and XLIST*dual-class (0.377) are not significantly different from zero. Overall, the table shows that while all cross-listed firms are traded at a premium relative to non-cross-listed firms, the valuation premium across different categories of cross-listed firms is independent of ownership structure after controlling for other firm-specific characteristics. Yet, given that the valuation of dual-class firms is lower than that of widely held firms, firms with dual-class shares benefit *proportionately* more relative to other cross-listed firms.

In Table 5 we consider how the impact of investor recognition varies cross-sectionally by ownership structure. Similar to Table 2, we control for potential endogeneity between Tobin's q and the investments of U.S. institutional investors using two-stage least squares. Given the evidence that U.S. investors avoid foreign firms controlled by a large blockholder, we include the dummy variables Control 20%+ and Dual-class as additional instruments when predicting INS_NUM and INS_HOL. Column 1 presents results of the first-stage estimates of INS_NUM, using the same instruments as in column 2 of Table 2, in addition to the two dummies for ownership structure. The coefficients on the control variables are similar to those reported above. More importantly, the coefficient on Control 20%+ (-0.155) is not significant, while the coefficient on Dual-class (-1.151) is large, negative, and significant, indicating that INS_NUM is lower for firms that separate cash-flow from control rights. U.S. institutional investors avoid investing in firms where the alignment of interests between controlling and minority shareholders is low and the risk of wealth diversionary behaviour or expropriation is greater. Thus, we fail to reject the third hypothesis (H3), that the level of investor recognition following cross-listing is lower for firms with dual-class shares than for widely held firms, but we do reject this hypothesis for firms with controlling shareholders and a single share class.

Column 2 of Table 5 presents the regression results of Tobin's q on the control variables, dummies for ownership structure, predicted INS_NUM, and six dummies capturing the interactions between cross-listing, ownership structure, and the relative number of U.S. institutional investors. In these regressions, the dummy variables INUMLO and INUMHI capture the base case for widely held cross-listed firms below and above the median for INS_NUM, respectively. X20_INUMLO and X20_INUMHI identify the interaction of Control 20%+ with INUMLO and INUMHI, respectively. XDC_INUMLO and XDC_INUMHI identify the interaction of Dual-class with INUMLO and INUMHI, respectively. Consistent with the evidence in Table 2, widely held cross-listed firms identified by INUMHI (0.521) have a premium valuation over non-cross-listed firms, while widely held cross-listed firms identified by INUMLO (0.125) have the same valuation as non-cross-listed firms. The coefficient on the dummy for the interaction of XLIST20 with INUMHI (-0.294) is negative and significantly different from zero, indicating that firms with blockholders of 20 per cent or more benefit less than other cross-listed firms identified by INUMHI. Dual-class firms identified by INUMHI are not statistically different from widely held firms in this category.

Among cross-listed firms that fail to widen their U.S. investor base appreciably (INUMLO), firms with dual-class shares benefit more than other categories of firms. The interaction of XLISTdual-class with INUMLO, XDC_INUMLO, is positive (0.464) and significant. This result is important, because it suggests that dual-class firms are benefiting from cross-listing even when they do not widen their U.S. shareholder base appreciably. This finding is consistent with a bonding effect due to an improvement in the firm's information environment. Firms with the greatest agency problems may benefit more from the greater monitoring and improved information environment following cross-listing than other firms, consistent with Doidge, Karolyi, and Stulz (2004), Lang, Lins, and Miller (2004), and Doidge et al. (2006).

We check the robustness of these results using our second proxy for investor recognition, INS_HOL, in columns 3 and 4 of Table 5. Column 3 is the first-stage regression of the predicted level of INS_HOL. The results are very similar and confirm that firms with a blockholder of 20 per cent or more benefit less when the proportional holdings of U.S. investors are high, while firms with dual-class shares benefit more when the proportional holdings of U.S. investors are low.

Overall, the findings in Table 5 suggest that cross-listed Canadian firms with dual-class shares attract fewer U.S institutional investors but benefit more from cross-listing even when they fail to widen their shareholder base. These results suggest that, while any potential bonding effect may be indistinguishable or completely subsumed by the investor recognition effect at high levels of investor recognition, there is evidence of a benefit from bonding at low levels of

investor recognition for firms with agency problems between controlling and minority shareholders. We fail to reject the fourth hypothesis (H4) for firms with dual-class shares, but reject it for firms with a blockholder of 20 per cent or more and a single share class.

4.4 Robustness using only firms that cross-listed between 1990 and 2003

The analysis thus far is open to the criticism that it does not adequately address endogeneity in the decision to cross-list, because of the matching procedure. While matching cross-listed with non-cross-listed firms has been used to control for endogeneity in a number of cross-listing studies (see footnote 12), critics may argue that the criteria used to create the matched sample are not the variables that explain the decision to cross-list. If this is the case, the results may not be robust if criteria other than size and industry membership are used to match cross-listed and non-cross-listed firms.[29] We therefore check the robustness of our results by constructing our sample differently. Rather than comparing cross-listed firms with non-cross-listed firms, we compare the cross-listed firms against themselves by looking at their valuation before and after cross-listing.

We identify all firms in our sample that cross-listed for the first time between 1990 and 2003. Firms that were cross-listed prior to 1990 are not included, since we do not observe their valuation prior to cross-listing. We exclude firms that cross-list at the time of an initial public offering or firms that cross-list following a spinoff for the same reason. Finally, we exclude firms that are taken over or that delist within one year of cross-listing. These restrictions reduce our sample to 530 observations for 69 firms. The median firm is in the sample for 7 years, with a minimum of 3 years and a maximum of 11 years.

Table 6 repeats the main results from Tables 2–5. Column 1 of Table 6 shows the regression of Tobin's q on the control variables, the dummy variables for concentrated ownership, and an XLIST dummy. Consistent with our earlier findings, the coefficient on Control 20%+ (0.003) is not statistically significant, while the coefficient on Dual-class (-1.052) is negative and significant, corroborating our finding that firms with dual-class shares are valued at a discount. The coefficient on XLIST (0.345) is positive and significant, indicating that post-cross-listing firms have a higher Tobin's q, on average, than their valuations prior to cross-listing. While the interaction of XLIST and control 20%+ (-0.021) is not significant, the interaction of XLIST and Dual-class (0.690) is positive and strongly significant, confirming that, on average, firms with dual-class shares benefit more from cross-listing than other firms, consistent with our fourth hypothesis (H4).

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[29] The same criticism applies to methods used in other studies to control for endogeneity in the decision to cross-list.

Column 2 of Table 6 tests the relationship between Tobin's q and investor recognition. We report results using our first proxy INS_NUM, although the results with INS_HOL are similar. Consistent with Table 2, the coefficient on INUMHI (0.651) is positive and significant, indicating that firms that attract higher than the median number of U.S. institutional investors benefit from cross-listing. The coefficient on INUMLO (0.342) is weakly significant, indicating that firms that attract fewer than the median number of U.S. institutional investors also experience an increase in valuation from cross-listing. These results confirm our earlier finding that the valuation premium post-cross-listing is sensitive to the extent of investor recognition.

Column 3 of Table 6 looks at the variation in a firm's valuation over time relative to the year of cross-listing. Unlike the earlier analysis in Table 3, we can include dummy variables for the years prior to cross-listing, since we observe the cross-listed firms before and after cross-listing. We substitute the dummy XLIST in column 1 with dummy variables for the years relative to the year of cross-listing. We create dummy variables for the period three years and more prior to cross-listing (base case), two years prior to cross-listing (XLIST year -2), one year prior to cross-listing (XLIST year -1), etc. The coefficients on these time-series dummy variables in column 3 correspond closely to the graph in Panel A of Figure 1; they increase monotonically from two years prior to cross-listing to the year of cross-listing, and then decline monotonically. Specifically, Tobin's q increases from 0.149 in XLIST year -1 to 0.603 in XLIST year 0, peaks at 0.655 in XLIST year 1, and then declines to 0.431 in XLIST year 2 and 0.352 in XLIST years 3–5.[30] Unreported results show that the coefficient is no longer significant from XLIST year 4 and onwards, suggesting that the average cross-listed firm returns to its pre-listing valuation within three years of cross-listing. The pre-listing run-up and post-listing decline confirm that the observed valuation premium post-cross-listing may not be related to cross-listing per se, but rather to other firm-specific factors.

In column 4 of Table 6, we examine the time-varying impact of investor recognition on the valuation premium, conditioned on whether a firm attracts more or less than the median number of U.S. investors in each year post-cross-listing. Similar to Table 3, we create dummies for the interaction between the year of cross-listing and INUMLO/HI. The coefficients on most years post-cross-listing for INUMLO are not statistically different from zero. The pattern for INUMHI is similar to the pattern documented in column 4 of Table 3, but more striking. Specifically, the coefficients on the years post-cross-listing decrease monotonically from 0.978 (statistically significant at less than 1 per cent) in the year of cross-listing to 0.318 (not statistically

[30] Note that the dummy for the period of three years and more prior to cross-listing provides the base or reference case.

significant) by year 3 following cross-listing. These results confirm that the valuation premium post-cross-listing depends on investor recognition, but that the importance of investor recognition wears off within three years of cross-listing.

The analysis in column 5 of Table 6 relates the valuation premium post-cross-listing to investor recognition and ownership structure. We repeat the regressions from Table 5, using dummies that capture the interaction of INUMLO/HI and Control 20%+ and Dual-class. Consistent with our earlier findings, the valuation premium of cross-listed firms with INUMHI (0.642) is significantly greater than zero, whereas the coefficient on INUMLO is not significantly different from zero. All firms that cross-list and attract a higher number of U.S. investors benefit, on average. Only the coefficient on the XLIST variable for firms with dual-class shares is positive and significantly different from zero. These results support our earlier finding that the benefits of the improvement in the information environment are distinct from a widening of the U.S. shareholder base for firms with the greatest agency problems between controlling and minority shareholders.

5. Conclusion

This study examines the cross-sectional and time-varying impact of investor recognition on the valuation of Canadian firms cross-listed on a U.S. exchange, conditional on ownership structure, liquidity, and other firm characteristics. We examine the change in Tobin's q ratios of 277 Canadian cross-listed firms over a 16-year period from 1989 to 2004. We show that increased valuations associated with greater investor recognition following a U.S. listing are temporary, not permanent. Consistent with the findings in Foerster and Karolyi (1999) and Baker, Nofsinger, and Weaver (2002), we find that the valuation of cross-listed Canadian firms increases with both the number and proportional holdings of U.S. institutional investors. But we show cross-sectionally that not all firms benefit from increased investor recognition following a U.S. listing. The firms that benefit most are the ones that are the most successful in broadening their U.S. investor base. Canadian firms that cross-list and attract few or no U.S. investors are valued no differently than non-cross-listed firms after controlling for firm characteristics.

Using panel regressions, we examine the impact of greater investor recognition on a firm's valuation over time. In contrast to the earlier studies, we find that the effects of greater investor recognition are temporary, not permanent. Even the Canadian firms that attract the highest number or proportional holdings of U.S. institutional investors experience a post-listing decline, with valuations that return to their pre-listing levels within three years of cross-listing. This result is robust when we benchmark cross-listed firms against a matched sample of firms listed

exclusively in the home market, or when we examine the valuations of cross-listed firms before and after their U.S. listing. While the expansion of a firm's U.S. shareholder base is a main factor associated with the increase of a Canadian firm's increased valuation at the time of cross-listing, the benefit to a firm's valuation from this effect is only transitory.

We find evidence that an increase in a firm's shareholder base and an improvement in its information environment are distinct but related effects. We identify these effects by focusing on the impact of cross-listing across firms with different ownership structures. In particular, we compare firms that are widely held with firms that have a controlling shareholder and a single share class, on the one hand, and firms that use dual-class shares to separate cash-flow from control rights, on the other. Firms with dual-class shares benefit relatively more whether they succeed or not in expanding their U.S. shareholder base. This result is consistent with a U.S. listing improving a firm's information environment and reducing the information asymmetry between controlling and minority shareholders for firms where the agency conflicts are most acute.

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Table 1: Descriptive Statistics

This table provides summary statistics for the matched sample of cross-listed and non-cross-listed Canadian firms. Financial firms are not included. Firm-year observations are matched without replacement based on two-digit NAICS industry codes and total assets measured in U.S. dollars. The final two columns show the difference between the mean (median) summary statistics across samples. Total assets are shown in U.S. dollars in millions, converted to U.S. dollars using the fiscal year-end exchange rate. Market value is total shares outstanding times price at calendar year-end. Tobin's q is computed as (total assets + market value of equity - book value of equity) / total assets. Sales growth is the two-year average growth rate in sales. If two-year data are not available, one-year growth in sales is used. Return on assets is earnings before interest and taxes / total assets. Leverage is total debt / total assets. Panel B provides statistics on the ownership structure of the firms in the sample. Widely held are firms where no investor has a control stake of 20% or more in the voting shares. Control 20%+ are firms where an investor owns 20% of more of the voting shares. Dual-class are firms with two or more classes of voting shares with different levels of votes. Panel C provide statistics on the wedge between the percentage of control and percentage of cash-flow rights for dual-class shares firms. Panel D shows the mean and median Tobin's q for the two samples across the different ownership structures. Panel E shows the mean and median Tobin's q for the two samples where the cross-listed firms are divided into two samples based on their success in attracting U.S. institutional investors. INUMLO (INUMHI) is a dummy equal to 1 for cross-listed firms in the lower (upper) half of number of U.S. investors based on 13-F filings.

Panel A: Mean (Median) summary statistics

	Non-XLIST			XLIST			Mean difference	Median difference
	N	Mean	Median	N	Mean	Median	(*t*-test)	(sign rank)
Total assets	1,401	995.0	270.7	1,401	959.0	263.3	-36.0	-7.4
Market value	1,401	712.1	210.7	1,401	842.6	225.5	130.6**	14.8
Tobin's q	1,401	1.401	1.199	1,401	1.783	1.352	0.381***	0.153***
Sales growth	1,401	0.295	0.0121	1,401	0.288	0.118	-0.007	0.106
Return on assets	1,401	0.014	0.0034	1,401	-0.036	0.016	-0.050***	0.013***
Leverage	1,401	0.277	0.268	1,401	0.251	0.221	-0.027***	-0.047***
Share turnover	1,395	0.116	0.015	1,397	0.174	0.012	0.058***	-0.003***

Notes: *, **, *** indicate significance level at 1%, 5%, and 10%, respectively.

(continued)

Table 1: continued

Panel B: Ownership structure (as % of each column)

	Non-XLIST (n=1,401)	XLIST (n=1,401)	Total sample (n=2,802)
Widely held	40.8	61.6	51.2
Control 20%+ (ex dual-class)	39.5	28.3	33.9
Dual-class shares	19.7	10.1	14.9
Total	100.0	100.0	100.0

Panel C: Separation between cash-flow and control rights for dual-class shares

	Non-XLIST	XLIST	Mean difference (*t*-test)	Median difference (sign rank)
Control % minus cash flow % - mean (median)	36.7 (35.0)	35.6 (35.1)	-1.1	-0.1
Control % / cash flow % - mean (median)	6.8 (3.0)	3.7 (2.1)	-3.1**	-0.9

Panel D: Tobin's q by ownership structure

	Non-XLIST			XLIST		
	N	Mean	p50	N	Mean	p50
Widely held	572	1.480	1.260	863	1.868***	1.424***
Control 20%+	553	1.454	1.225	396	1.726***	1.230
Dual-class	276	1.135	1.043	142	1.421***	1.175**

Note: Statistical significance of difference in mean (median) statistic based on *t*-test (sign rank test). *, **, *** indicate significance level at 1%, 5%, and 10%, respectively.

Panel E: Tobin's q by ownership structure and level of U.S. institutional ownership

	Non-XLIST			INUMLO			INUMHI		
	N	Mean	p50	N	Mean	p50	N	Mean	p50
Widely held	572	1.480	1.260	445	1.663***	1.337*	418	2.087***	1.531***
Control 20%+	553	1.454	1.225	237	1.677***	1.150*	159	1.799***	1.389***
Dual-class	276	1.135	1.043	73	1.254**	1.071	69	1.598***	1.448***

Note: Statistical significance of difference in mean (median) statistic based on *t*-test (sign rank test). *, **, *** indicate significance level at 1%, 5%, and 10%, respectively.

Table 2: Tobin's q and Investor Recognition

This table reports results of fixed-effects regressions that estimate the impact of cross-listing on Tobin's q, controlling for investor recognition. The sample comprises cross-listed and non-cross-listed Canadian firms from 1989 to 2004. Firm-year observations are matched without replacement based on two-digit NAICS industry codes and total assets measured in U.S. dollars. Tobin's q is computed as (total assets + market value of equity - book value of equity) / total assets. Log of assets is total assets in millions converted to U.S. dollars using the fiscal year-end exchange rate. Sales growth is the two-year average growth rate in sales. If two-year data are not available, one-year growth in sales is used. Industry q is the average Tobin's q for an industry based on the two-digit NAIC code for a given year. Leverage is total debt / total assets. ROA is earnings before interest and taxes / total assets. Share turnover is annual trading volume / shares outstanding. TSE300 is a dummy set equal to 1 if the firm is a member of the TSE300 index, and zero otherwise. Loss is a dummy set equal to 1 for firms with negative earnings before extraordinary items. R&D intensity is research & development expense / sales. Dividend yield is the yield on common shares. Capital raising is a dummy set equal to 1 for firms that issue equity in the United States at or subsequent to cross-listing. XLIST is a dummy equal to 1 identifying cross-listed firm-years. Predicted # investors is the predicted value from column 2. INUMLO (INUMHI) is a dummy equal to 1 for cross-listed firms in the lower (upper) half of # of U.S. investors based on 13-F filings. Predicted % U.S. investors is the predicted value from column 5. IHOLLO (IHOLHI) is a dummy equal to 1 for cross-listed firms in the lower (upper) half of % U.S. investors. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels.

Dependent variable	Tobin's q	LOG(# US INVESTORS)	Tobin's q	Tobin's q	% US INVESTORS	Tobin's q	Tobin's q
Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Constant	2.226***	0.431	2.313***	2.342***	0.071	2.291***	2.342***
Log of assets	-0.298***	0.326***	-0.312***	-0.311***	0.028***	-0.318***	-0.322***
Sales growth	0.213***	-0.091	0.216***	0.212***	0.002	0.210***	0.212***
Industry q	0.517***	-0.147	0.519***	0.512***	-0.033*	0.532***	0.528***
Leverage	-0.170	-0.572**	-0.133	-0.131	-0.015	-0.141	-0.126
ROA	0.814***	-0.009	0.844***	0.823***	0.006	0.835***	0.846***
Share turnover	0.057	-0.486***	0.082*	0.078*	-0.038***	0.089**	0.092**
TSE300	0.171***	0.304***	0.153**	0.132**	0.034***	0.142**	0.138**
Loss dummy		-0.128			-0.014		
R&D intensity		0.800			0.142**		
Dividend yield		-0.849			-0.106		
Capital raising		0.391***			0.042**		
XLIST	0.318***		0.200			0.199*	
Predicted # investors (INS_NUM)			0.063	-0.003			
INUMLO				0.203			
INUMHI				0.482***			
Predicted % U.S. investors (INS_HOL)						1.073*	0.641
IHOLLO							0.152
IHOLHI							0.356***
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	2792	1381	2776	2776	1381	2776	2776
Within R^2	0.120	0.212	0.123	0.129	0.137	0.124	0.128

Table 3: Regressions on Firms First Cross-Listed between 1990 and 2003

This table reports fixed-effect regressions on Tobin's q using only firms that first cross-listed between 1990 and 2003, matched with non-cross-listed Canadian firms. We consider observations only from the year of cross-listing (year 0) to the fifth year following cross-listing. The control variables are described in Table 2. XLIST year 0–5 are dummy variables identifying the year relative to cross-listing. Predicted # (%) of U.S. investors is the predicted absolute number (% holdings) of U.S. investors holding the cross-listed firm's shares from Table 2. INUMLO (INUMHI) year 0–5 are dummy variables indicating whether a firm was in the lower (upper) half of # investors for each year relative to cross-listing. IHOLLO (IHOLHI) year 0–5 are dummy variables indicating whether a firm was in the lower (upper) half of % U.S. investors for each year relative to cross-listing. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels.

Dependent variable	Tobin's q	Tobin's q	Tobin's q	Tobin's q
Variables	(1)	(2)	(3)	(4)
Constant	2.423***	2.529***	2.397***	2.633***
Log of assets	-0.328***	-0.317***	-0.287***	-0.328***
Sales growth	0.258***	0.221***	0.252***	0.244***
Industry q	0.432***	0.421***	0.411***	0.412***
Leverage	-0.042	0.042	0.098	0.115
ROA	1.290***	1.285***	1.306***	1.350***
Share turnover	0.050	0.069	0.048	0.074
TSE300	0.189**	0.207**	0.145	0.170*
XLIST	0.252			
XLIST year 0		0.245		
XLIST year 1		0.261		
XLIST year 2		0.166		
XLIST year 3-5		-0.015		
Predicted # investors (INS_NUM)			-0.072	
INUMLO year 0			-0.093	
INUMLO year 1			0.227	
INUMLO year 2			0.221	
INUMLO year 3-5			0.113	
INUMHI year 0			1.108***	
INUMHI year 1			0.602**	
INUMHI year 2			0.471	
INUMHI year 3-5			0.248	
Predicted % U.S. investors (INS_HOL)				0.102
IHOLLO year 0				-0.077
IHOLLO year 1				0.179
IHOLLO year 2				0.152
IHOLLO year 3-5				-0.058
IHOLHI year 0				0.611***
IHOLHI year 1				0.315
IHOLHI year 2				0.141
IHOLHI year 3-5				0.039
Year dummies	Yes	Yes	Yes	Yes
N	1325	1325	1318	1318
Within R^2	0.152	0.160	0.204	0.179

Table 4: Impact of Ownership Structure on Tobin's q

This table reports results from fixed-effects regressions that estimate the impact of ownership structure on Tobin's q using a matched sample of cross-listed and non-cross-listed Canadian firms from 1989 to 2004. Details on all variables can be found in Table 2. Control 20%+ is a dummy equal to 1 identifying control stakes of 20%+ where there is a one-share, one-vote structure. Dual-class is a dummy equal to 1 for firms with two or more share classes with different voting rights. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels.

Dependent variable	Tobin's q	Tobin's q	Tobin's q
Variable	(1)	(2)	(3)
Constant	2.451***	2.292***	2.317***
Log of assets	-0.291***	-0.299***	-0.300***
Sales growth	0.214***	0.214***	0.220***
Industry q	0.506***	0.508***	0.510***
Leverage	-0.175	-0.170	-0.167
ROA	0.786***	0.804***	0.801***
Share turnover	0.053	0.056	0.055
TSE300	0.192***	0.185***	0.186***
Control 20%+	0.015	0.047	0.074
Dual-class	-0.529***	-0.509***	-0.696***
XLIST		0.325***	0.303***
XLIST*control 20%+			-0.052
XLIST*dual-class			0.377
Year dummies	Yes	Yes	Yes
N	2792	2792	2792
Within R^2	0.120	0.125	0.126

Table 5: Impact of Investor Recognition on Tobin's q Controlling for Ownership Structure

This table reports results from fixed-effects regressions that estimate the impact of investor recognition on Tobin's q using a matched sample of cross-listed and non-cross-listed Canadian firms from 1989 to 2004. Endogeneity in the holdings of U.S. institutional investors is addressed using two-stage least squares where the number and percentage ownership of U.S. institutional investors is instrumented in the first stage, and the predicted values are used in the second stage. Details on all variables can be found in Table 2. Control 20%+ is a dummy equal to 1 identifying control stakes of 20%+ where there is a one-share, one-vote structure. Dual-class is a dummy equal to 1 for firms with two or more share classes with different voting rights. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels.

Dependent variable	LOG(# US INVESTORS)	Tobin's q	% US INVESTORS	Tobin's q
Variable	(1)	(2)	(3)	(4)
Constant	0.610	2.441***	0.078	2.430***
Log of assets	0.321***	-0.320***	0.028***	-0.329***
Sales growth	-0.107*	0.219***	0.002	0.215***
Industry q	-0.159	0.503***	-0.032*	0.526***
Leverage	-0.557**	-0.116	-0.015	-0.112
ROA	0.004	0.810***	0.007	0.816***
Share turnover	-0.494***	0.089**	-0.038***	0.099**
TSE300	0.288***	0.158***	0.033**	0.165***
Control 20%+ only	-0.155	0.102	-0.014	0.108
Dual-class	-1.151***	-0.647***	-0.011	-0.657***
Loss dummy	-0.134		-0.014	
R&D intensity	0.853		0.138**	
Dividend yield	-1.140		-0.116	
Capital raising	0.396***		0.042**	
Share turnover	-0.494***	0.089**	-0.038***	0.099**
Predicted # investors (INS_NUM)		0.012		
INUMLO		0.125		
INUMHI		0.521***		
X20_INUMLO		0.062		
X20_INUMHI		-0.294*		
XDC_INUMLO		0.464*		
XDC_INUMHI		0.100		
Predicted % investors (INS_HOL)				0.680
IHOLLO				0.074
IHOLHI				0.424***
X20_IHOLLO				0.100
X20_IHOLHI				-0.321**
XDC_IHOLLO				0.467*
XDC_IHOLHI				0.059
Year dummies	Yes	Yes	Yes	Yes
N	1,381	2,776	1,381	2,776
Within R^2	0.222	0.137	0.138	0.138

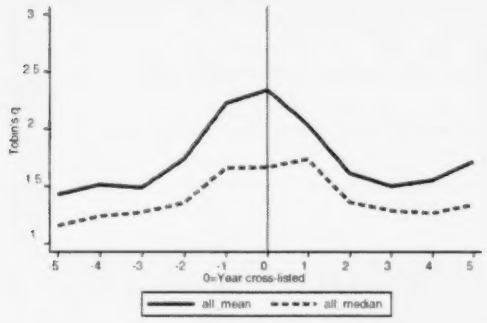
Table 6: Regressions before and after Cross-Listing

This table reports panel regressions on Tobin's q using only the observations of firms that first cross-listed between 1990 and 2003. The variables are described in Tables 4, 5, and 6. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels.

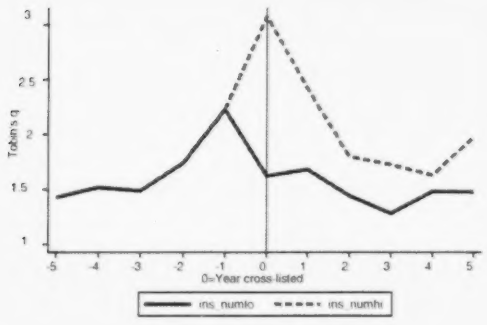
Dependent variable	Tobin's q	Tobin's q	Tobin's q	Tobin's q	Tobin's q
Variable	(1)	(2)	(3)	(4)	(5)
Constant	3.131***	2.758***	2.615***	2.559***	2.797***
Log of assets	-0.447***	-0.409***	-0.342***	-0.339***	-0.398***
Sales growth	0.246***	0.280***	0.186**	0.230***	0.285***
Industry q	0.682***	0.713***	0.613***	0.647***	0.700***
Leverage	-0.765**	-0.954***	-0.950***	-0.923***	-0.881**
ROA	1.496***	1.518***	1.473***	1.466***	1.470***
Share turnover	-0.119	-0.095	-0.136	-0.082	-0.093
TSE300	0.345***	0.254*	0.333***	0.251*	0.280**
Control 20%+	0.003	0.188	0.060	0.153	0.083
Dual-class	-1.052***	-0.625**	-0.564**	-0.649**	-0.985***
XLIST	0.345**				
XLIST x Control 20%+	-0.021				
XLIST x Dual-class	0.690***				
Predicted # investors (INS_NUM)		0.005		-0.006	-0.029
INUMLO		0.342*			0.222
INUMHI		0.651***			0.642**
XLIST year -2			0.048		
XLIST year -1			0.149		
XLIST year 0			0.603***		
XLIST year 1			0.655***		
XLIST year 2			0.431**		
XLIST year 3+			0.352*		
INUMLO year 0				0.050	
INUMLO year 1				0.407*	
INUMLO year 2				0.328	
INUMLO year 3+				0.281	
INUMHI year 0				0.978***	
INUMHI year 1				0.840***	
INUMHI year 2				0.517*	
INUMHI year 3+				0.318	
X20_INUMLO					0.307
X20_INUMHI					-0.131
XDC_INUMLO					0.676*
XDC_INUMHI					0.449
N	756	663	756	663	663
Within R^2	0.189	0.198	0.188	0.220	0.206

Figure 1: Change in Tobin's q around Cross-Listing

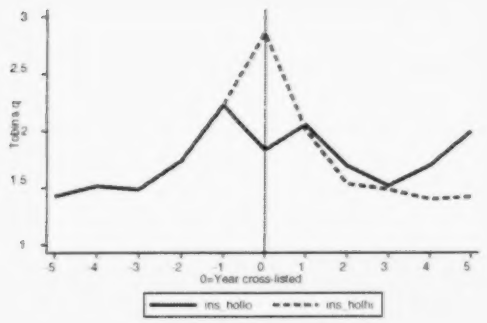
Panel A: Mean and Median Tobin's q, All Firms



Panel B: Low vs. High # U.S. Investors



Panel C: Low vs. High % U.S. Investors



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